

**ART 34 AMDT**Exhibit 1a**BEST AVAILABLE COPY**Claims

1. Thermally-formable and cross-linkable precursor of a thermally-conductive material comprising
  - 5 a) one or more crosslinkable polymers where the melt flow index of the polymer or mixture of polymers (measured at 190 °C and 2.16 kg according to ASTM D-1238), respectively, is 10-100 g/10 min and
  - b) one or more thermally-conductive fillers in an amount of at least 60 wt. % of the total weight of the precursor.
- 10 2. Precursor according to claim 1 wherein the crosslinkable polymers are selected from a group consisting of polyolefins and polyurethanes.
- 15 3. Precursor according to any of claims 1-2 wherein the crosslinkable polymer is a polyolefin having at least 30 % by weight ethylene units.
- 20 4. Precursor according to any of claims 1-3 wherein the polyolefin is selected from the group comprising copolymers of ethylene and (meth)acrylate esters.
- 25 5. Precursor according to any of claims 1-4 wherein at least one of the crosslinkable polymers comprises one or more moisture-curable groups.
- 30 6. Precursor according to claim 5 wherein the moisture-curable groups comprise silane groups.
7. Precursor according to claims 5-6 wherein the crosslinkable polymer is obtainable by reacting a polymer according to any one of the claims 1-6 with one or more vinyl silane compounds of the formula  $RR'SiY_2$  (I), wherein R is a monovalently olefinically unsaturated radical, R' is a monovalent radical free of aliphatic unsaturation and Y is a hydrolyzable organic radical, and a free-radical initiator.

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8. Precursor according to claim 7 wherein the vinyl silane compound(s) (I) are employed in an amount of at least 2 parts per 100 parts crosslinkable polymer or polymers.
- 5 9. Precursor according to any of the claims 7-8 wherein the free-radical initiator is selected from the group consisting of an organic peroxide and an organic perester.
- 10 10. Precursor according to claim 9 wherein the free-radical initiator is employed in the amount of at least 0.1 parts per 100 parts crosslinkable polymer or polymers.
- 15 11. Precursor according to any of claims 5-10 comprising a catalyst for moisture-curing of the moisture-curable group in an amount of greater than 0.05 wt. % based on the total weight of the precursor.
- 20 12. Precursor according to any one of claims 1-11 wherein the thermally-conductive filler is selected from a group consisting of alumina, aluminum oxide, aluminum trihydroxide and magnesium hydroxide.
- 25 13. Method of manufacturing the precursor of any of the claims 1-12 comprising the steps of:
- a) providing one or more crosslinkable polymers where the melt flow index of the polymer or mixture of polymers (measured at 190°C and 2.16 kg according to ASTM D-1238 ), respectively, is 10-100 g/10 min and
- b) compounding the polymer or polymers with one or more thermally-conductive fillers in an amount of 60 wt. % of the total weight of the precursor in a heated mixing device.
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14. Method of manufacturing the precursor of any of the claims 7-12 comprising the steps of:

5 a) providing one or more crosslinkable polymers where the melt flow index of the polymer or mixture of polymers (measured at 190°C and 2.16 kg according to ASTM D-1238 ), respectively, is 10-100 g/10 min and where at least one of the polymers has an ethylene unit content of at least 30 % by weight,

10 b) reacting the polymer with a vinyl silane of the formula (I), wherein R is a monovalently olefinically unsaturated radical, R' is a monovalent radical free of aliphatic unsaturation and Y is a hydrolyzable organic radical, and a free-radical initiator in a heated mixing device to produce a moisture-curable polymer and

15 c) compounding the moisture-curable polymer or polymers, respectively, with one or more thermally-conductive fillers in the amount of at least 60 wt. % in a heated mixing device.

15. Method of manufacturing a shaped thermally-conductive material comprising the steps of:

20 a) providing the precursor of any of the claims 1-12.

b) thermally forming the precursor to a desired shape and

c) crosslinking the precursor.

16. Method according to claim 15 wherein cross-linking is effected by applying  $\gamma$ -irradiation.

25 17. Method according to claim 16 wherein the  $\gamma$ -irradiation has an energy of between 50 keV-25 MeV.

30 18. Method according to any of claims 16-17 wherein the  $\gamma$ -irradiation is applied to the precursor in a dosage of at least 50 kGy.

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19. Method according to claim 15 wherein cross-linking is effected by moisture-curing.
20. Method of any of claims 15-19 where the precursor is thermally-formed into the shape of a film by extrusion.
21. Thermally-conductive material obtainable by the method of any of the claims 13-20.
22. Adhesive tape comprising at least a film backing bearing an adhesive layer on at least one of the major surfaces of the film backing, wherein the film backing is obtainable by extruding the precursor according to any of the claims 1-12 into the shape of a film and crosslinking the film.
23. Adhesive tape according to claim 22 having a dielectric strength of at least 55 kV/mm as measured according to DIN EN 60243-1.
24. Adhesive tape according to any of the claims 21-23 having an effective thermal conductivity of at least 0.4 W/m-K as measured according to ASTM D 5470-95.
25. Adhesive tape according to any of the claims 21-24 having a thickness of less than 300 µm.
26. Adhesive tape according to any of the claims 21-25 where the crosslinked thermally-conductive material of the film backing has an elastic torque,  $S'$ , of between 5 dNm and 8 dNm, as measured according to ASTM D 6294-9.
27. Adhesive tape of any of the claims 21-26, wherein the adhesive is a pressure-sensitive adhesive.

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28. Use of an adhesive tape according to any of the claims 21-27 for providing thermal conductivity between two substrates.
29. Assembly comprising the adhesive tape according to any of the claims 21-27 in a bonding relationship between two substrates.
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